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THE VALUE MANAGER - A NEW ROLE

Mike Charnley-Fisher
Value Services Leader

Mike Charnley-Fisher is a Principle Project Engineer working for Trafalgar John Brown Oil and Gas and is currently holding the role of Value Manager for the BP Bruce Phase II development. Up until recently he held the same role on the BP Cleeton Compression project. He qualified with a B.Sc. in Metallurgy and a M.Sc. in Applied Mechanics. He became a chartered Mechanical Engineer whilst working for McDermott Engineering London. He spent eight years employed with McDermott in a number of positions; piping materials, corrosion, layout, weight management, mechanical engineering, engineering automation, and business development, on projects for a variety of clients including BP, Shell, Conoco, British Gas, and Esso. Following a two year period as a self-employed consultant on advanced computer systems, he joined John Brown. He worked on the BP/TH pre-Alliance cost saving initiative, contributed to setting John Brown's award winning "Global Office" information strategy, and helped to define the Trafalgar approach to Alliancing, prior to joining Cleeton Compression project in October 1993.

THE VALUE MANAGER - A NEW ROLE

Clients are increasingly reducing costs by focusing on their core areas of competence . Coupled with an increased degree of partnering between client and contractor, this has resulted in increased focus on life cycle issues during project execution. The need to feed back life cycle data into the design decision making process, especially when linked with commercial risk and reward arrangements, has led to the creation of a new role - Value Manager.

The role includes quantifying Key Success Factors, developing commercial details for risk and reward sharing, and accelerating decision making. It can encompass managing the changing requirements between *concept* and *project execution*, detailed Key Success Factor trade-offs, risk and opportunity analysis, and project publicity. Relationships with the conventional functions of project services, client teams (operations, project, asset) have had to be re-defined. Breakdown structures, risk and reward, and confidentiality are raised as issues.

INTRODUCTION

Until relatively recently the measure of a successful project was that it was completed on time, under budget and to the required quality. Quite what the latter meant was never clearly understood, and contractors largely saw it as the responsibility of others, usually the client, to ensure that downstream operational and production targets were met. The mechanism for achieving this was often to have a large client team, several volumes of paper - telling the contractor exactly what he was to design and how he was to do it. This was allied to competitive tendering between concept, front end design, detail design, and procurement and project management phases. Downstream contracts for services such as fabrication, installation, and hook-up and commissioning, as well as orders for equipment, were placed on a just-in-time basis and surrounded by extensive penalties if costs or schedule milestones were not met. The client alone sought to ensure "quality".

For a variety of reasons during the late 80's clients, and BP in particular, recognised that they had to change and re-focus on their core activities. In conjunction with significant internal restructuring, BP Exploration established joint venture initiatives with a number of contractors for exploring better ways of executing capital projects. This culminated in some of the first contracts to take the "Alliance" approach. Also in conjunction with other operators who recognised that change must happen, the industry saw the formation of the UK Cost Reduction Initiative for the New Era (CRINE).

The Alliance approach was new in that it;

- invited contractors to participate in developing the total economic viability of the project,
- extended the *target plus* style of contract to cover non-CAPEX issues,
- recognised the value of continuity between design phases of the project, and the value of early participation by fabricators, installers, suppliers, and other traditionally downstream parties.
- embraced the functional approach, and behavioural and cultural changes, which were being advocated by CRINE and the Norwegian equivalent (NORSOK).

Whilst Trafalgar John Brown (TJB) were awarded a significant fabrication contract for one of the first "Alliance" projects (Andrew), the first design contract to be awarded to TJB on the Alliance basis was for BP Cleeton Compression. The enquiry for this work was remarkably thin, with the functional requirement for the development essentially reading;

BP would like to add a compression capability to its existing Cleeton production facilities The Key Success Factors are as follows.

- Safety
- Capital Expenditure (CAPEX)
- Operational Expenditure (OPEX)
- Contract Gas Date
- Availability
- Constructability
- Operations Interface
- External Opportunities

It was in the context of addressing these ill defined factors that TJB proposed the role of Value Manager.

DEFINITION OF THE ROLE

Quantification of Key Success Factors

For the above Key Success Factors to mean anything, they must be converted into measurable units against which performance can be monitored and challenged. Given that there will always be a requirement to make trade-offs between each of these factors, that it is desirable to have a common "currency" which can reflect time.It must be sensitive to the context of the project and the obvious choice is money - expressed as *present value.*

Whilst the unit may be obvious, the relationship between the various factors and money is less obvious;

- In order for *safety risks* to be As Low As Reasonably Practical (ALARP) there has to be some form of relationship between economics and quantified safety measures such as Potential Loss of Life. However, this has to be taken in the context of the commercial viability of the project.
- *CAPEX and OPEX* are more traditional, although the latter is quite difficult to estimate when in the context of an existing operation. For Cleeton measures such as maintenance technician man-hours, direct costs of spares, unit complexity of substructure (number of jacket legs), and number of additional equivalent process units were used to prorate the existing operational budget.
- *Contract Gas Date* was converted to the cash flow loss arising from lost production. Account was taken of gas penalty. Particularly in the case of a development which supplements declining reservoir production, it is interesting to note that sensible trade-offs can be made between cost and schedule - start-up dates need not be cast in concrete.
- *Availability* was converted to percentage loss of revenue, as was fuel gas consumption.
- *Constructability* was considered to be represented by CAPEX.
- Aside from the soft measures indicated by individuals perceptions of the effectiveness of the interface, and the OPEX budget itself, *gas penalty* during offshore construction activities was treated as the main financial measure of the *effectiveness of the interface.*
- *External Opportunities* were measured in terms of the potential overall economic added value of the opportunity. There is an observation to be made here; the project reacted to requests to study options in a more or less traditional way. What became apparent after the event was that a number of engineering options were studied in some detail which, when assessed in overall economic terms, were clearly non-starters. The importance of having an understanding of overall economics cannot be overstated if effort is not to be wasted in these early studies.

Development of Risk and Reward Incentives

Traditional contracts can be awash with almost arbitrary liabilities which can be extremely difficult to enforce in law. The Alliance approach makes use of stated incentives and commitments which in theory should replace all such liabilities. The Cleeton contract does not contain such additional clauses, but we know of other Alliance contracts which still retain them.

The initial approach on Cleeton was to try and align all Alliance parties to some form of single overall economic measure based on the "value model", and to support it by measurement during operations. It was demonstrated how much each of the contributing factors impacted total economics, and what the likely swing in values was likely to be via risk analysis.

For a variety of reasons; inability to influence, inappropriate risks, lack of common understanding, and difficulty of measurement, this model was simplified to comprise only *CAPEX, Availability, and Gas Penalty -* with essentially linear relationships between change in outcome versus financial risk and reward. This was supplemented by a project commitment to continue to make decisions on the basis of overall economics. As an example, the CAPEX graph is illustrated in Figure 1.

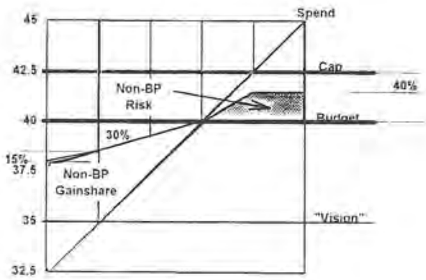

Figure 1: CAPEX and Risk Reward Relationship

Whilst *availability* takes into account reliability, which in turn has a direct impact on the main OPEX driver (maintenance technician man-hours), when taken alone it is an unbalanced measure. The comprehensive model incorporates difficult to measure partial non-availability, maintenance strategy, sparing philosophy, and is difficult to apply beyond OREDA availability norms.

Given these difficulties and limitations the approach now favoured by the author is essentially to make use of a fairly standard CAPEX based risk/reward formula which allows the base CAPEX target to be adjusted to reflect life cycle issues discounted using the chosen economic fundamentals. This provides the necessary incentive for the design team who have greatest influence on the life cycle outcome. As is the case with Cleeton, there should be a commitment to treat justified post start-up remedial work as CAPEX.

In the case of underwriting OPEX, this should be done on the basis of calculated final targets set immediately prior to the operational phase, not on theoretical estimates generated early in front end engineering.

Life Cycle Costing

Fundamental to setting up quantified key success factors and to setting risk and reward targets is the requirement to create a complete life cycle costing model which can be used on an interactive basis by the project. This life cycle or "value model" contains simplified versions of all of the elements which contribute to development economics; capital and operational cash flows, economic parameters, and, if applicable, drilling costs and revenue streams. It is in the approach to establishing this model where the role of Value Manager differs from that of more traditional value engineering.

Management of Risk and Opportunity

Once a base case has been established risks and opportunities can be identified, some of which can be significant. Associated with risks are the actions required to mitigate and assess their impact, and in the case of opportunity, actions to evaluate and realise their value. The Value Manager provides a natural central role for co-ordinating these actions which might otherwise end up being forgotten or ignored.

The main focus is an actions database, which, in addition to collating actions arising from other sources, such as minutes of meetings, also manages and reports on ongoing risks and *ideas for improvement*. This is coupled to the life cycle cost perspective originating from the other value activities.

ROLE TRANSITION - CONCEPT TO EXECUTION

Accelerated Decision Making

The traditional route to concept and early front end work is illustrated by the simplified plan shown in figure 2;

- fixed process conditions will be assumed,
- a multi-discipline design will be developed,
- the engineering data will be passed on to estimators and planners,
- an economic analyst or value engineer who will incorporate revenue and assess the life cycle impact.

This complete cycle will be repeated until an option is generated which is financially robust.

Figure 2 Traditional Approach to Option Selection

The value management approach is slightly different in that it establishes engineering building blocks, collates unit cost and economic information, incorporates scaling factors and uses the project specific value model to iterate through the multitude of options. This approach is illustrated in Figure 3.

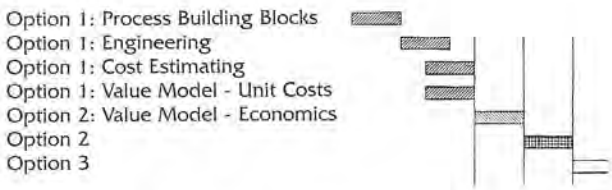

Figure 3 Value Model Approach to Option Selection

The net result is that in a given period of time a greater number of options can be assessed and so a more optimal solution is likely to be achieved.This approach requires a different relationship with many traditional project functions - a topic which is expanded upon in a later section. It also brings the economic impact of design change much closer to the originators of those changes - the engineers. Furthermore it recognises that the main driver during concept selection and early front end engineering is essentially the equipment list, and that the results produced by the sophisticated tools often employed by downstream disciplines, are only as good as the input data allows.

The Sanction Process

Traditionally the process leading up to sanction is co-ordinated by the client team, with little feed-back of non-CAPEX data back into the engineering team. By adopting the value management approach, there is a total project based framework for achieving sanction, the process of cost estimation, cost verification, cash flow forecasting, and risk analysis involves all parties thereby providing the groundwork for designing incentives etc. This all requires co-ordination and planning.

Since the sanction estimate forms the basis for project control estimates and initial scope definition, there is significant involvement of cost control and planning disciplines. In view of the fact that all inputs ultimately end up within the model, it is in the interests of the Value Manager to manage this complete process.

Detailed Key Success Factor Trade-offs

As design progresses into the detail phase, the main issues which arise are the trade-offs between capital expenditure and life cycle measures encapsulated within the Key Success Factors. These trade-offs are highly project specific since the underlying economics, coupled with investment cash flow limitations, all affect the value of short-term CAPEX, versus longer term life of field, factors.

Whilst the overall economic factors still apply, the relatively coarse model created for option selection in the early phases of the project is inappropriate for detailed decision making. The Value Manager role therefore changes to one of identifying and overseeing the application of life cycle techniques which take into account detailed reliability statistics, maintenance issues, fuel consumption, etc. This is an extension of the traditional commercial and technical evaluation process and can readily be covered by the creation of a life cycle assessment procedure.

The one major difference to practices which were prevalent during the 80's is that commercial and technical evaluation can no longer be isolated. Engineers must be familiar with all costs if true value decisions are to be made. In general, procurement specialists do not have the training to make such decisions.

The Value Manager role encourages this increased cost awareness by engineers. As a university lecturer once said *"the difference between an engineer and a scientist is that the former worries about cost"*.

The table below shows the current balance of achievement against the success factors developed for the Cleeton Project.

	Achievement to date
• Safety -	*No impact on safety risk quite an achievement for a major modification to an existing facility.*
• Capital Expenditure (CAPEX)	*£58m original estimate, £40m sanction, £33-34m out-turn*
• Operational Expenditure (OPEX)	*Likely to be 10-20% below budget*
• Contract Gas Date	*One month ahead of schedule*
• Availability	*96,7% comp. (first year), 98,84% overall*
• Constructability savings	*Reflected in CAPEX*
• Operations Interface	*".. a major success with respect to relationships between people."*
• External Opportunities (flexibility to take on change)	*40+ different 3D CAD models built during FEED, significant late change incorporated in detail design.*

Table 1 Key Success Factors (and Achievements to date)

Information Facilitator

For the Value Manager role to be effective, a vast amount of information has to be managed and processed. Manual transfer of this data would take too long, so there is a heavy reliance on electronic exchange. In the absence of systems which have not been designed to handle such information in a consistent way, a significant amount of effort is required to manage engineering databases which feed into the value model tool.

Since the principle behind the approach is to store unit cost information against the engineering definition (rather than transfer engineering data to an estimating system) the Value Manager must develop knowledge about how project information generally is stored.

This knowledge can later be applied for different application. Examples include the generation of *site based material management data,* the rapid modification of the *engineering cable system* to allow for cable pulling and testing on site, and the electronic population of the site based *mechanical completion system.*

This requires a combination of system skills, engineering background, and commercial awareness.

Project Publicity

Once the value techniques have been established and control budgets put in place, project execution follows a more or less traditional path. In order to maintain the increased awareness of overall project objectives, and maintain the positive team spirit for the project, there is a need to publish current status against the Key Success Factors. Perhaps done less than it should have been on Cleeton, the Value Manager was responsible for publishing the occasional project magazine and press articles in support of the project. Maintaining peoples awareness of the whole contributed significantly to achieving success for the project - but all too often individuals are left isolated and become introverted within their discipline.

RELATIONSHIPS WITH CONVENTIONAL FUNCTIONS

The mechanism for achieving accelerated decision making means that there are changes to the way in which some individuals contribute to the project. The schedule based changes described previously can also be described in the form of flow chart differences.

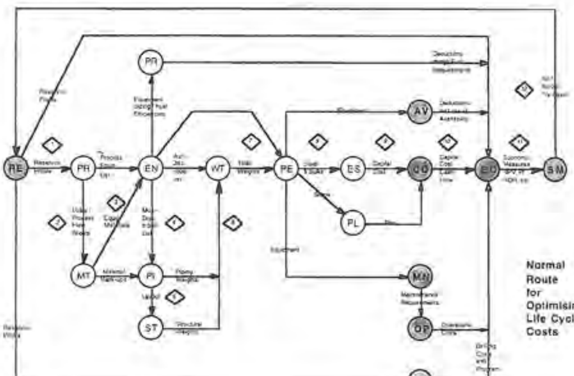

Fig. 4: Traditional Flow chart for the flow of information for life cycle costing.

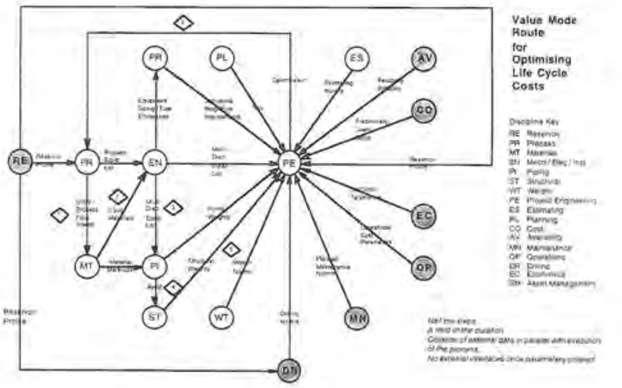

Fig. 5: The Value Model Approach to Life Cycle Costing

In broad terms, instead of applying sophisticated discipline specific information tools, disciplines are asked to try and simplify inputs into something which can be modelled in a database or on a spreadsheet. Whilst the accuracy of the individual contribution may be compromised, the approach is much more in keeping with the likely quality of the primary input, the equipment list.

Project Services - Estimating, Planning, Cost

The most significant change is the way in which estimating operate. Instead of having complete engineering definition, the estimating function contributes unit costing information to the model and has a role in challenging the overall results.

Planning input is required for cash flow forecasting purposes. Client cost input is also collated via the model - rather than being applied over the top of a contractor produced estimate.

Asset Team - Management, Reservoir, Commercial

Traditionally, contractor inputs are filtered through client project teams and then on to the client management for overall collation of economics. The value model approach encourages much greater dialogue with the team ultimately responsible for making the case for the project. Indeed, for active assets, experience suggests that they are more than grateful if some of their workload can be carried directly by the project. Reservoir input is required when revenue has to be calculated.

Operations

It is important that the model has as good a representation of OPEX costs as possible, particularly where the development is a modification to an existing facility. Operations input is particularly important for assessing and agreeing maintenance activities and, when appropriate, any potential risks with respect to combined operations and modification works.

Client Specialists - Availability, Maintenance
The value management approach encourages the simplification of certain specialist inputs. However, it is only those specialists who can provide that simplification and validate that the results produced are representative enough for decision making purposes.

Project Team
Costing data is stored within the source engineering systems and then collated via the value model approach. Relationships therefore have to be developed with the discipline groups for directly accessing specialist electronic information. This approach has the side benefit of improving general cost awareness.

THE ROLE OF THE CONTRACTOR

In the traditional sequential approach, the quality of information is often degraded in the supply chain. For example, occasionally downstream decisions are made which have an impact on upstream activities, without the decision maker being aware of the impact.

One of the benefits of having client engineers within a design contractor team is that, because of their generalist overview, they can spot inappropriate activities, they can help identify issues which would otherwise fall through a crack and decisions which have an impact. They are also independent of internal contractor politics and procedures which may make it difficult for contractors engineer to contribute in the same way.

By operating along the lines described in this paper, the contractor is effectively providing a truly integrated function for the client - complementing what would otherwise be internal piece-meal activity.

Many would argue that the increased costs of modern projects is almost entirely due to the over-specialisation of the industry - this approach is one way of redressing the balance.As implied earlier, closer involvement between design contractor and client can help eliminate unnecessary and ill-informed work at the detailed level. Whilst the contractor organisation may be pleased to have been paid for doing this work, the individuals who make up the project only find frustration in such cases.

OTHER DIMENSIONS

Industry Breakdown Structures
One of the difficulties in implementing the above approach to early design is the difficulty in obtaining historical information which can be used with confidence. There is no standard tender format, which all parties understand, for obtaining and recording the cost, weight, take-off, and availability information required for life cycle costing. It is also difficult to see how industry cost performance and bench-marking initiatives can operate without a consistent breakdown structure.

Finally it is also very difficult to get computer applications to talk to each other in a sensible way - hence the heavy dependence on systems expertise eluded to in this paper - different breakdown structures have somehow to be mapped to each other.

There are the embryos of such a systems - the OREDA database and the Statoil / Hydro developed Standard Cost Coding System are good examples.

All of the above issues could be addressed, and tendering and estimating costs could be significantly reduced if such a common system were established. It is a fundamental building block which appears to have escaped the attention of many current industry initiatives.

Openness and Confidentiality
In order to produce results which can be trusted, there is a need to make use of reliable cost information. In practice raw costs are rarely that different from different sources. What can be different are the profit and overhead recovery elements of the final price and any technical or behavioural innovations which might contribute. These are sensitive to competitive positioning and market conditions. However, these latter factors typically have a validity life-time of no more than about six months - particularly in view of the high mobility of individuals across the industry.

Similar arguments apply to economics. The majority of commercial assumptions are consistent with industry published forecasts. From a revenue point of view probably the only confidential thing is the price obtained for the product and the timing of when development activities are planned. The latter become public knowledge once major tendering exercises involving more than a few companies are carried out.

De-coupling the truly commercially sensitive elements, such as the source of particular numbers, from the raw data should allow it to be published on a much wider forum than is currently the case. An industry wide historical cost database and a standard, regularly published, set of economic assumptions to use for life cycle costing would also encourage wider cost awareness and greater understanding of commercial drivers. Perhaps the Internet could be used to provide such a service.

Reservoir Management

Experience has demonstrated that the commercial viability of offshore projects is affected as much by reservoir management as it is by facilities development. Reservoir management affects cost and time value of drilling, which contributes to at least half of the cost outlay, and process equipment sizing. The traditional approach typically provides a fixed set of production profiles, as seen by the reservoir engineer, against which the process engineer extracts the various peaks and designs the equipment.

In practice reservoir prediction is highly uncertain and is managed in any case during operation. It is therefore not fixed but variable. If an efficient loop exists between designer and reservoir engineer the profile can usually be adjusted to allow greater optimisation of the equipment cost / timing / revenue trade-off.

Incentive, Risk, Performance, and Competition

In developing and applying the risk and reward model for Cleeton, and in having been involved in subsequent bids where new models have been proposed, it has become apparent that it is very easy to get confused.

A financial incentive is all about providing a mechanism which encourages cost reduction. In order to be effective it must be attached to those activities which can be influenced and not those which are "given". It must also be large enough to be worthwhile having - and must be greater than the value of increased turnover achieved by growth as a result of change. It must encourage mutual co-operation between parties and scope transfer to the most cost effective party.

Ideally risks should also be apportioned on the ability of a party to influence. In practice the risk, and therefore the potential reward, is more often divided according to an organisations ability to carry that risk. The mechanism usually used is to fix a proportion of total cost. If it is believed that the trend will be for cost reduction, there are considerable benefits to be had by operating on a totally reimbursable basis. Conversely, if it is perceived that costs will rise, it is desirable to lump sum. The amount of hedging should therefore be a function of perceived outcome, and this is driven most by confidence in the underlying basis for the cost. If costs are validated as being realistic, that there is the belief that costs will reduce, and there is sufficient incentive, there is no need for a risk side.

Recent successes have demonstrated that performance is driven by team co-operation and alignment. If the culture, set by senior project management, is right there is no need for specific Alliance or equivalent risk and reward contracts - they simply help the process. The importance of culture should not be underestimated.

Finally competition. There is the temptation to lose sight of the purpose of risk and reward schemes and use them to wrap up competitive position with respect to being prepared to take on significant risk. Taking on risks of high value is not necessarily a commitment, particularly if the probability of the risk occurring is very low. Competitive offers should be distinct from risk and reward forms of compensation.